

# **High Occupancy Vehicle (HOV) Facility Inventory and Clearinghouse**

## **Website Support and Maintenance Plan**

**Prepared for  
HOV Pooled Fund Study  
and  
Federal Highway Administration**

**by**



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## 1. Introduction

The HOV Clearinghouse website was developed to provide a comprehensive central repository of HOV-related information, documentation, and products. It is intended to be a one-stop location for HOV-related information. In addition to providing published information, it is also intended to facilitate information exchange and sharing among HOV practitioners.

Once the Clearinghouse site has been created, it needs to be maintained and updated so that it remains a valuable resource. One of the most important responsibilities in managing a website is to make sure it is updated regularly and works properly. If information is outdated or parts of the site do not function, users will lose trust in the integrity of the site and stop visiting it. The purpose of this Support and Maintenance Plan for the HOV Clearinghouse and Inventory website is to provide a plan, strategies, and tools for long-term operation, maintenance, and enhancement of the HOV clearinghouse and the facility inventory. This includes guidance on the staffing, resources, and data management and warehousing needs for the long-term operation, support, and maintenance of the HOV Clearinghouse. This plan describes the activities necessary for the Clearinghouse to provide services over the long-term and the expected resources necessary to fulfill those maintenance and support responsibilities.

## 2. Overview of the Clearinghouse

The Clearinghouse website contains a number of features to facilitate the website being a central repository of HOV and High Occupancy Toll (HOT) related information for practitioners and other users to share. Figure 1 below shows how users can access the different features from the website's main page.



Figure 1: HOV Clearinghouse Website Main Page

## 2.1 Inventory

This feature houses detailed database on a comprehensive list of existing and planned HOV and HOT facilities. The inventory database includes both *Highway* (controlled access highways and expressways) and *Arterial* HOV facilities in the United States and Canada, and the associated detailed HOV facility characteristics such as location, type, status, number of lanes, length, vehicle eligibility, hours of operation, peak hour traffic details, violation and penalties, time savings, and facility contact. As shown in Figure 2, users can view a complete list of all the HOV facilities included in the database with selected data field, generate custom reports showing only the data the user selects, and download a worksheet list with the comprehensive data.



Figure 2: HOV Facility Inventory Feature Interface

## 2.2 Resources

This feature houses a variety of HOV-related material, including reports, white papers, case studies, presentations, brochures, and other material. These documents are grouped into the following categories:

- General Documents
- Conference Proceedings
- Planning
- Design
- Operations
- Enforcement
- Performance Monitoring and Evaluation
- ILEV/Hybrid Vehicles
- Lane Pricing
- Managed Lanes
- Policy
- Software
- Training

Figure 3 shows the Resources feature link interface.

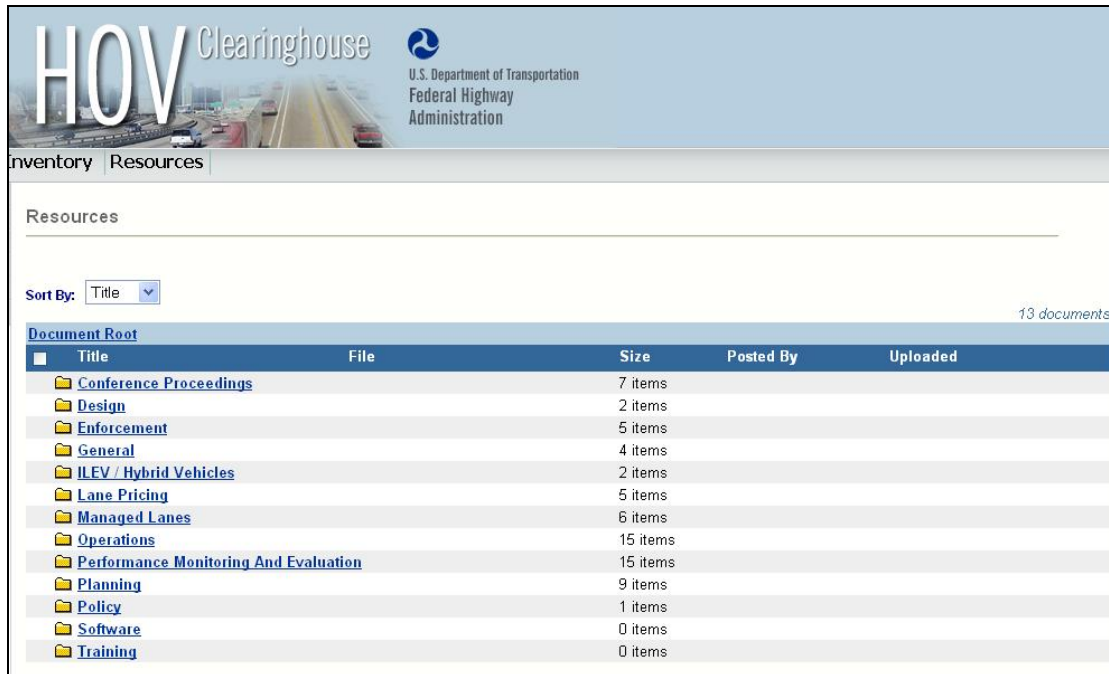


Figure 3: Resource Feature Interface

## 2.3 Discussion Forum

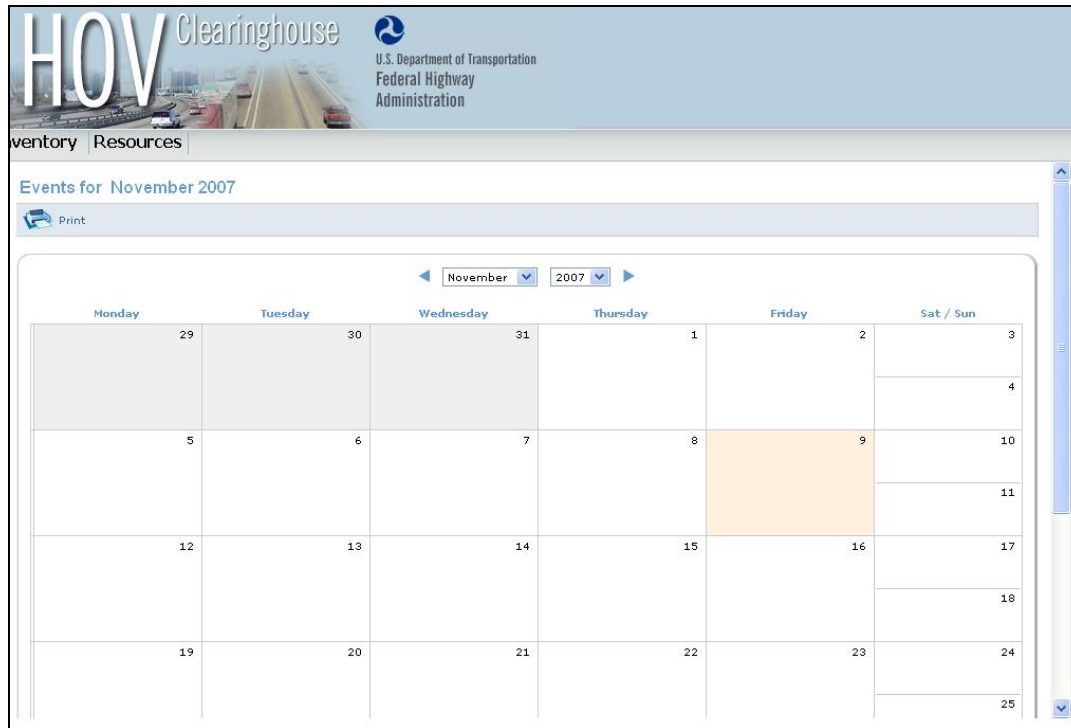
This feature provides practitioners with a centralized area for discussion of HOV/HOT-related questions and activities. Users can post questions and respond to other practitioner's questions, allowing multiple practitioners with diverse experience and knowledge to post information and leave a written record for all users to read. Figure 4 shows the Discussion Forum feature link interface.



Figure 4: Discussion Forum Feature Interface

## 2.4 Calendar

This feature provides information on upcoming events around the country related to HOV/HOT that might be of interest to practitioners. Events include training courses, conferences, organizational meetings, and hearings. Figure 5 shows the Calendar feature link interface.



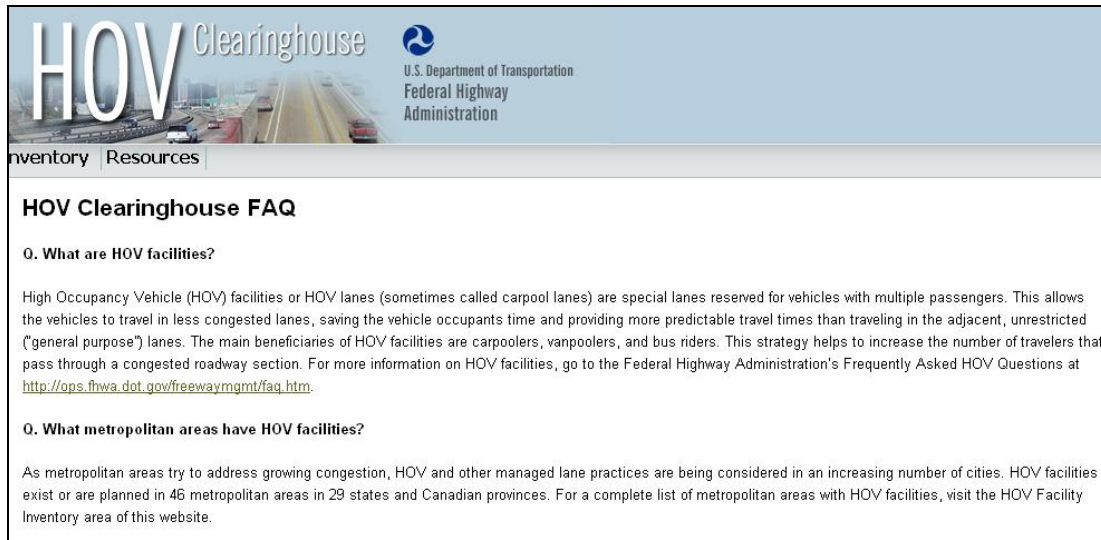
**Figure 5: Calendar Feature Interface**

## 2.5 Frequently Asked Questions (FAQ)

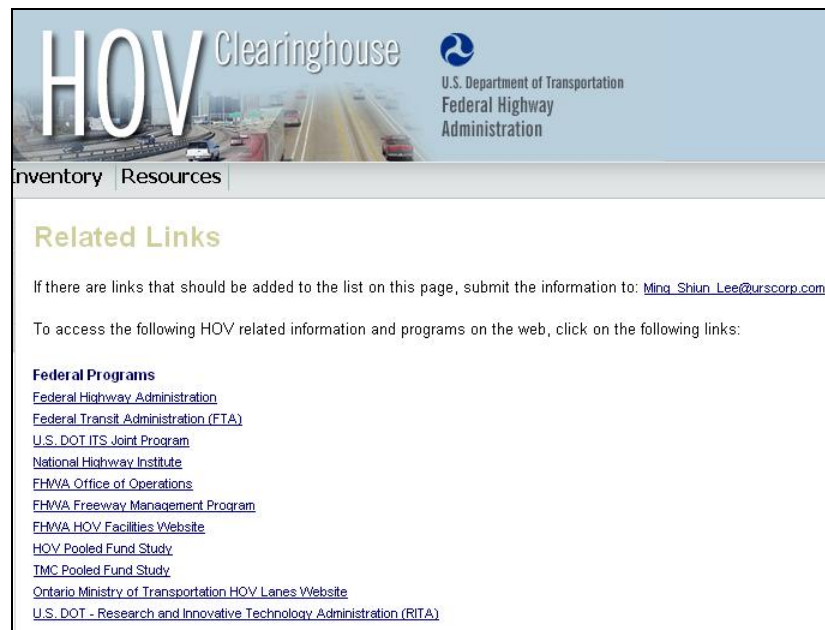
This feature provides the general background information on the Clearinghouse and answers the questions related to the website subject matter and navigating the website that might be asked by a non-technical audience (e.g., public, media, community leaders, etc.). Figure 6 shows the FAQ feature link interface.

## 2.6 Links

This feature provides links to external HOV/HOT-related websites. The websites are grouped into categories for Federal Programs, Professional Organizations, State DOTs, MPOs and Regional Transit Agencies, and Academia. Figure 7 shows the Links feature page interface.



**Figure 6: FAQ Feature Interface**



**Figure 7: Links Feature Interface**

## 2.7 Administrative Functions

This password protected area allows the site administrator to manage and edit some of the website features directly through the web interface. The administrator logs into the site using a secure password to access the following editing applications:

- **Link Editor** - Edit, add, and delete links
- **User Editor** - Edit (including changing user privileges), add, and delete user accounts



- **Calendar Editor** - Edit, add, and delete calendar entries
- **Forum Type Editor** – Edit, add, or delete a discussion forum title
- **Forum Message Editor** – Edit, add, or delete message postings
- **Resource Editor** – Edit, add, and delete folders and files on the Resources page

Figure 8 shows the Administrative feature link interface.

The screenshot displays the HOV Clearinghouse Administrative Feature Interface. The header includes the HOV Clearinghouse logo and the U.S. Department of Transportation Federal Highway Administration. The navigation bar shows 'Home', 'HOV Facility Inventory', 'Resources', and 'Admin logged in: Paul Lamb Log Out'. The sidebar menu on the left includes 'Calendar', 'Discussion Forum', 'Contact Us', 'Links', and 'Administrative'. The 'Administrative' menu is highlighted with a red circle, and a callout box labeled 'Administrative Menu' points to it. The main content area displays a table of users with columns for Name (Last, First), Information (UserName, Phone), and Privileges (Role). Below the table are buttons for 'Add New User', 'Delete User', and 'Reset Password'.

Name		Information		Privileges
Last	First	UserName	Phone	Role
Benson	Jeff	jbenson		GENERAL
Lamb	Paul	plamb	612-373-6463	ADMIN
Ledford	Mark	mledford		ADMIN
Lee	Ming-Shiun	mlee		ADMIN
Shults	Wade	wshults	830-438-5167	ADMIN
Ugolik	Wayne	wugolik		GENERAL
User	Guest	guest		GENERAL
Yung	Jessie	jjung		GENERAL

Figure 8 Administrative Feature Interface – User Editor

### 3. Support and Maintenance Activities

The website administrator has to conduct a number of activities to support and maintain the proper function and quality of the HOV Clearinghouse website over a long term. These activities, priority and the frequency are described in the following sections.

#### 3.1 Operations Check

This activity involves reviewing existing pages and features of the website to make sure that it is operating correctly. The website administrator should navigate the website, and purposefully check all the feature links as well as the associated web pages and the HOV database to ensure that the website works properly. The key activities and the priority for operations check are listed below:

- Check each feature link on the main page
- Check all the links and image files under each feature link
- Check HOV facility inventory database (search, customized report and download features)
- Check discussion forums (test question and answer posting)
- Check "Contact US" link (send and receive messages)
- Check proper URLs for the links



The Operations Check activities should be performed monthly.

### 3.2 Maintain and Update Content

This activity involves updating and editing the content of the website to make sure that it is up-to-date. Updates include:

- **Inventory Update** – This activity involves requesting updated information for the HOV Inventory and updating the Inventory database with new information. The website administrator will send out a survey to request those who are listed as facility contacts in the inventory database to provide updates for the existing, new, or planned facilities. The HOV inventory will be updated based on the information received from the survey. The HOV inventory is stored in a Microsoft Access database, and some fields must be coded before entering them into the website database in order for the on-line search function to work. The website administrator also has to export the Access database to an Excel file and upload the Excel file to ensure the database consistency to the website to allow users to download the updated comprehensive list of facilities and their characteristics.

Formal requests would be sent to HOV facility contacts annually. The database would be updated whenever information is sent in, either as a result of the annual request or from information submitted at another time.

- **Clearinghouse Resources Update** – This activity involves uploading new files into the Resources page of the Clearinghouse website. These new files include both materials that are sent to the site administrator by users and materials that the administrator finds while monitoring events and activities in the HOV community. This update activity should be performed monthly.
- **Calendar Update** – This activity involves entering information about HOV/HOT-related events in the Calendar and updating any existing events as appropriate. This includes information that is brought to the attention of the site administrator by users and information that the administrator finds while monitoring events and activities in the HOV community. This update activity should be performed bi-weekly or as the administrator is aware of events.
- **Discussion Forum Update** – This activity includes periodically reviewing the discussion forum messages to ensure that spammed or inappropriate messages are removed from the discussion. Messages are currently posted in the discussion thread immediately with no supervision, so it is possible for inappropriate messages to be posted. These messages can distract from the exchange of information and may eventually cause users to stop reading the discussion forums. Periodic review of postings will help minimize the improper messages that readers might come across.

This activity also includes summarizing the discussion forum after a certain amount of time and the discussion is over. This summary allows users to briefly view the discussion consensus or results before deciding whether to read each individual post in the thread. Post review activities should be done at least weekly. Summaries should be performed one month after a forum was started.

- **Link Update** – This activity involves adding new HOV/HOT-related links to the website and updating existing links if a website has changed its URL. These websites include ones that are brought to the attention of the site administrator by users as well as those that the administrator finds while monitoring events and activities in the HOV community. This activity should be performed monthly.
- **Contact Information Update** – This activity involves updating the contact information on the “Contact Us” page of the website and making any necessary changes regarding where comments entered through the feedback form should be directed. This activity should be conducted as soon as changes in contact information are made available to the site administrator.

### 3.3 Quality Control

The site administrator should use several quality check procedures to maintain the website quality when any updates or other changes to the website are made. These quality check procedures will help ensure that no errors are inadvertently implemented on the website due to the website updates. These procedures include:

- **Quality Check** – make sure site and web page is error free (spelling, grammar, correct references, links direct users to correct pages, etc.)
- **Checking Pages** – check pages and modifications after modifications are made to make sure new and previously existing features work
- **Compliance Check** – make sure that FHWA requirements are met so that the page can be housed on the FHWA server

These procedures should be followed every time an update is made to the website.

### 3.4 Account Management

This activity includes monitoring and managing user accounts so that users have appropriate access to password-protected materials on the website. This includes adding new user accounts, granting the account appropriate user rights to access parts of the site, and deactivating accounts for users who change positions or are no longer in the HOV field. This activity should be performed every other week or as necessary.

### 3.5 Response to User Questions and Comments

This activity includes responding to questions and comments submitted to the site through the Contact Us page. These questions might be about technical aspects of the website, technical questions about HOV/HOT facility operations or management, or general questions related to HOV facilities. The website administrator will need to determine whether to answer the question directly or forward it to an appropriate expert.

This activity should be performed as questions or comments are received. The response time should be one day or sooner.

### 3.6 Tracking Usage

This activity includes monitoring such usage measures as the number of users visiting the site, the most frequently visited pages, and the files most frequently downloaded. By monitoring this activity, the website administrator can see trends that reflect the needs and interests of users. This analysis can be used when determining future enhancements and modifications to the site.

Activity summaries should be presented to the HOV Pooled Fund Study to inform them what the most popular items on the site are.

This activity should be performed monthly.

### **3.7 Backup**

This activity stores a copy of the website and associated files in case the website is damaged. If the website somehow becomes damaged or corrupted, the previous, uncorrupted version can be uploaded to quickly restore the website instead of requiring substantial programming resources to rebuild the site. This activity is performed by the host server manager, in this case FHWA.

This activity should be performed weekly or per FHWA requirements.

### **3.8 Maintenance Activity Frequency Table**

Table 1 summarizes the maintenance activities and the required frequency.

**Table 1: Maintenance Activity Frequency**

<b>Frequency</b>	<b>Activity</b>
As Necessary	<ul style="list-style-type: none"><li>• Update Inventory</li><li>• Quality Control Check</li><li>• Response to User Questions &amp; Comments</li></ul>
Weekly	<ul style="list-style-type: none"><li>• Review Discussion Forum Postings</li><li>• Site Backup</li></ul>
Bi-Weekly	<ul style="list-style-type: none"><li>• Calendar Updates</li><li>• Account Management</li></ul>
Monthly	<ul style="list-style-type: none"><li>• Operations Check</li><li>• Clearinghouse Resources Update</li><li>• Discussion Forum Summary</li><li>• Link Update</li><li>• Tracking Usage</li></ul>
Annually	<ul style="list-style-type: none"><li>• Send Formal Inventory Update Requests</li></ul>

## **4. Resource Needs**

This section identifies the resources needed for maintaining the website including tools, staffing, and their roles and responsibilities.

### **4.1 Tools**

The HOV Clearinghouse and Inventory website does not require much in the way of specialized software to maintain. The website administrator will need an HTML or website editing software (such as Dreamweaver, GoLive, or Expression Web Designer) that can develop files in compliance with Section 508. The site administrator will also need software to check files and the site to make sure that they are compliant with Section 508.

## 4.2 Staffing

The website will need the services of several categories of staff for maintenance and support, though individual time commitments will be low. The staff categories and responsibilities necessary for long-term maintenance and operations include:

- **Administrative** – Staff members in this category make minor changes to the website, such as uploading documents, updating the Inventory database, managing user accounts, and updating the Calendar. It is estimated that administrative effort will be 10 hours per month on average.
- **Programmer** – Staff members in this category makes more substantial changes to the website in ways to improve use of the website, such as adding new features or redesigning a page. It is estimated that programming activities will be 8 hours a month on average, though this will be spread unevenly throughout the year, with more time concentrated around major site modifications.
- **HOV Expert** – Staff members in this category will use their knowledge of HOV facilities to answer technical questions and recommend new documents, links, and events that should be added to the website. It is estimated that expert activities will average 2 hours per month.

## 4.3 Roles and Responsibilities

The roles and responsibilities for the staff to work together in maintaining the website are summarized in the Table 2. The website administrator will be the point of contact responsible for coordinating and delegating all the maintenance activities with other staff.

**Table 2: Maintenance Activity Responsibility**

Activity		Responsibility	
		Primary	Secondary
Operations Check		Administrator	Programmer
Maintain and Update Content	Inventory Update	Administrator	Programmer
	Clearinghouse Resources Update	Administrator	Programmer
	Calendar Update	Administrator	Programmer
	Discussion Forum Update	Administrator	Programmer
	Link Update	Administrator	Programmer
	Contact Information Update	Administrator	Programmer
Quality Control	Quality Check	Administrator	Programmer
	Web Page Check	Administrator	Programmer
	Compliance Check	Administrator	Programmer
Account Management		Administrator	Programmer
Response to User Questions and Comments		Administrator	HOV Expert
Tracking Usage		Administrator	Programmer
Backup		FHWA	Programmer

## 4.4 Cost Estimates

The annual labor cost for maintaining the website is estimated at \$17,000. This estimate is based on the time efforts necessary to conduct the required activities and the wages for the staff. This estimate does not include the costs associated with website hosting and backup services which are assumed to be provided by FHWA.

## **5. Recommended Enhancements**

The HOV Clearinghouse website was created as a comprehensive resource for HOV/HOT-related material, so the site administrator should be thinking of ways to improve the site and keep it relevant, either in adding new content or making the site easier to use. The following enhancements would improve how the site is used by both general users and the site administrator.

### **5.1 User – Enhancements for Publicly Viewing Site**

- Expand the facility inventory database to Include managed lane facilities. As the HOV Pooled Fund Study is considering broaden the scope to include managed use lane concept, it would be necessary and beneficial to enhance the clearinghouse to become a one-stop location for resources related to not only HOT/HOT facilities but also managed lanes.
- Improve look and feel of the Resources page. The entry page to the Resources area does not contain a description of what type of information this area contains, how to use it, or how users should make the site administrator aware of documents that might be appropriate to include.
- Let users submit/recommend events to include in Calendar for approval by site administrator. Currently users just see the monthly calendar pages when they go to this feature. It would be useful for registered users to submit entries for the site administrator to review and determine whether they belong on the calendar.
- Improve look of Discussion Forum page, making it easier to read. The entry page to the Discussion Forum feature would benefit from some introductory text explaining the feature. The feature itself is easy to use once a user enters the Open Forum link.
- Initially show only the original discussion thread title. With a large number of discussions possible, it would be easier for the user to skim the originating discussion titles instead of seeing all the thread titles as well. With a large number of posts, this could make finding a certain discussion harder.
- Add a search feature to the Resources page. While the resources are stored in subject folders, a keyword search would help make searching easier for users. It would also help locate files that might touch on multiple subjects.
- Add cost information to the HOV Inventory database. Estimated construction costs, operational budget, and sources of funding for construction or operations funding would be useful information for users to know, if such information is available.
- Add a site map for improved navigation. Currently navigation is not an issue for the site, but as the site grows a site map would be useful in finding desired resources on the site.

### **5.2 Administrator Functions**

- Ability to edit Inventory database through web interface. Currently the administrator must edit inventory data in an Access database before placing it in the website database. Allowing the administrator or selected facility contacts to enter data directly into the

website would reduce the data management time and reduce errors during the coding process.

- Email alert to administrator when a new post is made at the discussion forum. This would enable the site administrator to review and publish user postings more quickly while screening spammed or inappropriate messages from the discussion.
- Allow links to activities to be posted in the Calendar. This would allow the user to link directly to an external web page managed by the event organizer to get more information. This would let users go directly to the source of event information to ensure that they have access to up-to-date information.
- Allow administrator to edit web page text. Administrator access currently allows the administrator to only edit select features, not change any text on web pages. While these changes can be achieved through an HTML or website editing program, allowing text changes while logged onto the site would allow administrative level managers who do not have knowledge of or access to these programs to make minor changes.
- Adding a dropdown list or legend for the Role Field under User Editor to state what the different roles are and explain what access the role allows.